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GOAL-BASED NEW SHIP CONSTRUCTION STANDARDS

Comments on document MSC 109/4/1

Submitted by IACS

SUMMARY

Executive summary:	This document comments on the final report of the GBS audit addressing observation No. IACS/2015/FR1-8/OB/02 presented in document MSC 109/4/1 by the Secretary-General; and proposes reaffirmation of the criticality of adherence to the principles of good seamanship and the responsibility for proper operation and maintenance, as well as endorsing and encouraging the need for the continuous development of the structural requirements of organizations which are recognized by the Administration in accordance with the provisions of SOLAS regulation XI-1/1, or national standards of the Administration.
Strategic direction, if applicable:	7
Output:	7.24
Action to be taken:	Paragraph 17
Related documents:	MSC 108/19; MSC 109/4/1; resolutions MSC.287(87) and MSC.454(100)

Introduction

1 This document is submitted in accordance with the provisions of paragraph 6.12.5 of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.5) and provides comments, inter alia, on paragraph 3.3 of the annex to document MSC 109/4/1.

Discussion

2 SOLAS regulation II-1/3-10.2 states:

> "Ships shall be designed and constructed for a specified design life to be safe and environmentally friendly, when properly operated and maintained under the specified operating and environmental conditions, in intact and specified damage conditions, throughout their life."

3 SOLAS regulation I/10 underscores the need for proper maintenance, so that the ship is maintained in conformity with SOLAS, as follows:

> "(a) The condition of the ship and its equipment shall be maintained to conform with the provisions of the present regulations to ensure that the ship in all respects will remain fit to proceed to sea without danger to the ship or persons on board."

4 In determining measures towards safe navigation and avoidance of dangerous situations, SOLAS regulation V/34.2 places emphasis on monitoring sea state and meteorological information, as follows:

> "2 The voyage plan shall identify a route which:
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> .1 takes into account any relevant ships' routeing systems;
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> .2 ensures sufficient sea room for the safe passage of the ship throughout the voyage;
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> .3 anticipates all known navigational hazards and adverse weather conditions; and
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> .4 takes into account the marine environmental protection measures that apply, and avoids as far as possible actions and activities which could cause damage to the environment."

5 Moreover, SOLAS regulation V/34-1 also places emphasis on the right of the master to make decisions based on their professional judgement, as follows:

> "Master's discretion
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> The owner, the charterer, the company operating the ship as defined in regulation IX/1, or any other person shall not prevent or restrict the master of the ship from taking or executing any decision which, in the master's professional judgement, is necessary for safety of life at sea and protection of the marine environment."

6 The *International goal-based ship construction standards for bulk carriers and oil tankers* adopted by resolution MSC.287(87) state in respect of avoidance of precluding innovation and specially permitting it, as well as applying structural rules changes, as follows:

> **"1 PREAMBLE**
>
> 1.1 The notion of "goal-based ship construction standards" was introduced in the Organization at the eighty-ninth session of the Council in November 2002 through a proposal by the Bahamas and Greece, suggesting that the Organization should develop ship construction standards that would permit innovation in design but ensure that ships are constructed in such a manner that, if properly maintained, they remain safe for their entire economic life."; and
>
> "6.3 Once the rules for the design and construction of bulk carriers and oil tankers of an Administration or recognized organization have been verified as being in conformity with the Standards, this conformity shall be considered to remain in effect for rule changes, provided that no verification of rule changes has resulted in a non-conformity. Unless the Maritime Safety Committee decides otherwise, any rule changes introduced as a result of verification of conformity shall apply to ships for which the building contract is placed on or after the date on which the rule change enters into force."

7 Paragraph 3.3 of the report in document MSC 109/4/1 draws the Committee's attention to the consideration of the effects of bad weather avoidance in development of structural rules, as follows:

> "3.3 Furthermore, while wave data in both, Rev.1 and Rev.2 of IACS Rec.34 are considering the actual operation of ships according to SOLAS regulation V/34, the Audit Team is of the opinion that effects of bad weather avoidance become ever more significant for ships in view of the application of IACS Rec.34/Rev.2 to develop rule motions and loads. Hence, developed rules should appropriately account for the above in scantling assessment formulations, as well as in defining safety margins."

Role of good seamanship and duty and discretion of the ship's master to avoid bad weather

8 As mentioned above, it is the normal practice of ship operation to monitor sea state and meteorological information; ships are required to avoid bad weather conditions by SOLAS regulation V/34. The obligation to operate properly and to maintain the ship rests with the company. While IACS considers different operational conditions in its data analysis as per the functional requirement II.2 of SOLAS regulation II-1/3-10, the concerns and suggestion expressed by ICS et al. in paragraph 39.1 of document MSC 108/19, stating that the determination of rule requirements should be on the basis of "the most extreme conditions experienced by ships" are, in the opinion of IACS, in conflict with SOLAS and Load Lines Convention as this would negate the role of good seamanship and the duty and discretion of the ship's master to avoid bad weather.

9 Such an approach also misrepresents the concept of safety margins in ship structural design implying that, without them, should a ship be unable to reroute for a specific reason, it would not withstand worse conditions than design. And this is because the ultimate hull girder strength criteria consider the wave with the lowest exceedance probability. In fact, to obtain a design standard for wave loads (design loads) for the purpose of designing a safe ship, it is of great importance to determine the extreme loads that a ship will experience within the design life and with a certain probability of occurrence. This aligns with the approach adopted in the *Revised guidelines for verification of conformity with the international goal-based ship construction standards for bulk carriers and oil tankers*, adopted by resolution MSC.454(100), and is also the approach that IACS has utilized in determining the ship design parameters. IACS Recommendation 34 forms just one of the many elements that are used to derive loads used for ship structural design.

10 IACS is concerned by the far-reaching implications for the IMO regulatory regime and industry self-regulation if the course of action to account for "the most extreme conditions experienced by ships" (outside of a probabilistic approach) is accepted. Such an approach would send a message that good seamanship and caution, as well as the master's right to take decisions based on their professional judgement (as per SOLAS regulation V/34-1), can be sacrificed against commercial interests. Given the increasing trend towards aggressive weather routeing of ships driven by artificial intelligence (AI), IACS believes it is essential that the Committee recognize and reinforce the obligation in the conventions for proper weather routeing to be maintained and for Member States to be cautious against any devaluation of the role of weather routeing when considering ship design requirements.

Continuous improvement of the Common Structural Rules

11 Key principles underpinning goal-based standard regulations are the facilitation of continuous improvement and non-hampering of innovation and rule development, as recognized by the *International goal-based ship construction standards for bulk carriers and oil tankers*, adopted by resolution MSC.287(87).

12 Cargo ships have been designed and built with an understanding that their commercial life is subject to market forces, i.e. demand for maintenance and repair of the ships to keep them available for trade. Ships are generally sent to the scrapyard when their commercial life ends as the market forces dictate rather than by regulation.

13 However, classification rules and regulations have been established to allow ships to remain in service as long as possible subject to survey, maintenance and repairs, as deemed necessary. Consequently, and even before the full effect of PSPC[1] is seen, challenges other than ship structural strength, e.g. environmental requirements, fuel efficiency or charterer requirements, become more important for the decision to take a ship out of service.

14 The 25-year service life of a ship can be severely impacted by poor maintenance or operation but, equally, it could be extended under benign operating conditions. Additionally, improvements in safety culture and other measures, such as the implementation of the PSPC, ESP Code[2] and other relevant IMO instruments, are having a positive impact on the service life of ships.

15 Over many years and prior to the GBS regime, IACS was updating the Committee on its work to evolve structural rules. The GBS Standard recognizes the need to have structural rules which will permit innovation in ship designs. To maintain that goal, the recognition of the value of performing unimpeded research and development of the structural rules by the organizations, which are independent of commercial or political interests, needs to be reaffirmed.

Proposals

16 Considering the existing SOLAS requirements for operation and maintenance of ships, as well as pertaining to the structural rule development, IACS proposes that the Committee reaffirm, in the context of GBS audits:

.1 the criticality of adherence to the principles of good seamanship and the responsibility of companies for proper operation and maintenance of ships as means of compliance with applicable IMO safety instruments; and

.2 its encouragement to continue improving the structural rules and similar national requirements using the evolution of knowledge and the experience gained during inspections, reflecting technological advances and benefits to safety brought about by the Committee's regulatory decisions, such as the ISM Code, the ESP Code, PSPC, Means of Access, etc., and future ones.

Action requested of the Committee

17 The Committee is invited to consider the proposals in paragraph 16 and to take action, as appropriate.

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1 *Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers*, adopted by resolution MSC.215 (82).

2 2011 ESP Code – *International code on the enhanced programme of inspections during surveys of bulk carriers and oil tankers, 2011*, adopted by resolution A.1049(27)